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PROGRESS REPORT OPERABLE UNIT 3 - PRODUCTION AREA OCTOBER 1993

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Operable Unit 3
PRODUCTION AREA

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Introduction

The Remedial Investigation/Feasibility Study (RI/FS) is the blueprint for cleanup at the U.S. Department of Energy's Fernald Environmental Management Project. The nature and extent of contamination at the Fernald site and surrounding areas is being thoroughly investigated so that appropriate remedial actions can be formulated and implemented.

The Fernald site has been divided into five sections, known as Operable Units, for environmental investigation and cleanup. The Operable Units were defined based on their location or the potential for similar technologies to be used in the ultimate cleanup.

During the course of the RI/FS effort, certain conditions are occasionally identified which call for more immediate action. These actions are called "removal actions" and are initiated when there is a need to accelerate cleanup activities to address releases or potential releases of hazardous substances. Removal actions are coordinated with the U.S. EPA and the Ohio EPA.

Following is a progress report on Operable Unit 3 including its history, the current status of RI/FS activities, cleanup alternatives under consideration, and work that is being done to alleviate near-term concerns.

Background

Operable Unit 3, the former production area and production-associated facilities, is one of the largest and most complex of the Fernald site Operable Units, largely due to the wide variety of former processing and support facilities located within this 136-acre study area. When the mission at the Fernald site was production of high-purity uranium metal for U.S. defense programs and the processing of thorium to support other DOE programs, large quantities of radioactive materials and some hazardous chemicals were used in the various plants involved in the process. Operable Unit 3 focuses on cleanup of contamination in the former production area resulting from the 37-year production mission at the Fernald site. The primary contaminant is uranium, and the main focal points of cleanup are buildings, equipment, and support facilities.

RI/FS Activities

RI/FS Work Plan Addendum: The RI/FS Work Plan for Operable Unit 3 has received final approval from the U.S. EPA. The final version of the plan recognizes the pursuit of a separate interim Record of Decision for the decontamination and dismantling of all Operable Unit 3 structures as an interim action concept (discussed below).

Proposed Interim Action: The DOE has proposed to U.S. EPA a methodology that will accelerate the decontamination and dismantling of Operable Unit 3 structures. A Proposed Plan has been prepared and submitted to U.S. EPA and Ohio EPA for review and comment. The Proposed Plan provides an evaluation of options available and selects a preferred alternative based on the results of the evaluation.

Upon receipt of document approval, a public comment period will be opened to provide a forum for evaluating community acceptance of the Proposed Plan and to gather and resolve public comments. Following the public comment period, a draft Interim Record of Decision (IROD) will be prepared and submitted to U.S. EPA and Ohio EPA for approval.

Based on current planning assumptions and scenarios, the interim action approach could result in

up to three years acceleration of the remediation process and result in over $300 million in project savings due to avoided operations and maintenance costs.

Field Investigation: Field sampling activities for characterization of the Operable Unit 3 structures began in September 1993, following U.S. EPA approval of the RI/FS Work Plan. The resulting laboratory analyses will support the development of a baseline risk assessment for the former production area, and the determination of the scope of cleanup work in Operable Unit 3. Field sampling activities are anticipated to require about 12 months to complete.

Treatability Studies: Operable Unit 3 is developing plans for the testing of potentially applicable innovative technologies to support the decontamination, dismantling, and treatment requirements of remedial actions. Technology alternatives will be tested for applicability, effectiveness, cost, waste minimization, secondary waste generation, and other key evaluation criteria. Screening of many technologies has been completed, revealing possible opportunities to reduce costs and minimize short- and long-term risks.

Technologies to be tested and the particular tests to be conducted will be detailed in a Treatability Study Work Plan for Operable Unit 3, which will be submitted to the U.S. EPA in January 1994, for review and comment.

Removal Actions

Plant 1 Pad Continuing Release (Removal Action No. 7): The purpose of this removal action is to protect surface soils and regional groundwater from continuing releases of hazardous materials resulting from waste management activities on the eight-acre Plant 1 storage pad. This removal action is being conducted in three phases.

Phase I, the implementation of run-on and run-off control measures and the installation of underground utilities, is complete.

Phase II, the installation of a new covered concrete storage pad (80,000 square feet) adjacent to the existing Plant 1 storage pad, was completed December 4, 1992. Remaining drums of low-level radioactive waste in outdoor storage on the Plant 1 Pad are being moved into the two new covered storage structures, which are equipped with containment facilities for spill control, drainage, and stormwater runoff/run-on control.

Phase III involves activities to upgrade the existing Plant 1 storage pad, including the installation of a polyurethane membrane and epoxy coating over the pad surface to minimize contaminant migration to the environment. Drum movements to clear areas for Phase III construction were completed in July 1993. Construction began in August 1993. Phase III is on schedule for completion by February 19, 1995.

Removal of Waste Inventories (Removal Action No. 9) This removal action involves the characterization, overpacking, and disposition of low-level radioactive waste materials. The removal of waste inventories is ongoing at Fernald.

The Fernald site has approval from the DOE Nevada Field Office to dispose of general waste streams at the Nevada Test Site (NTS), including: process area scrap wastes (scrap metal and wood); construction and Removal Action waste (demolition debris); residues and thorium waste (refinery feed and oxides); and baled trash. However, as the result of a DOE-Nevada audit conducted in July-August 1993, approval to ship baled trash has been temporarily suspended.

Deficiencies found during the audit gave rise to a 30-day grace period from the auditors in order to initiate necessary corrective actions to avoid a temporary suspension of all waste stream shipment activity. Corrective Action teams have met weekly from the five major subject groups where deficiencies were found, and many improvements were completed prior to the lead auditor's return on September 2, 1993.

When all of the planned improvements and controls are completed by October 25, 1993, it is anticipated that the suspension on baled trash will be lifted, and additional waste streams in the Fernald contract, such as asbestos, slag from scrap metal recycling and additional thorium waste, will be approved.

The waste shipping goal for Fiscal Year 1993 was to dispose of 67,000 drum equivalents (DEs) of low-level radioactive waste to NTS, and 50,000 DEs of low-level radioactive waste through subcontractors. This goal includes currently-generated waste from construction and restoration activities

(30,000 DEs), characterized backlog waste (30,000 DEs), scrap metal (40,000 DEs estimated to eliminate the scrap metal and scrap copper bulk storage areas), and process area scrap metal (17,000 DEs) for a total of 117,000 DEs by September 30. The total off-site shipments for Fiscal Year 1993 is 110,743 DEs.

The overpacking of 5,600 drums of thorium compounds in Building 65 is expected to begin in mid-1994. Modifications to existing facilities in and adjacent to Buildings 64 and 65 are necessary prior to overpacking this material into strong, tight containers appropriate for shipment.

Stabilization of Uranyl Nitrate Inventories (Removal Action No. 20): The processing of uranyl nitrate inventories was initiated in September 1992. In November 1992, after the initial 20,000 gallon batch had been processed as part of a systems operability test, the system was placed on hold to allow for an evaluation of systems. Processing resumed April 13, 1993, but was stopped April 20, 1993, to complete a commitment requiring an operational readiness review. Processing remains on hold until an investigation into a check valve leak that occurred in April 1993, has been completed and necessary improvements are made. This removal action is expected to be completed in late 1994.

Uranyl nitrate is an intermediate product in the former uranium recovery process at Fernald. There are approximately 230,000 gallons of acidic uranyl nitrate stored in 21 tanks in or near the Plant 2/3 Refinery.

A 1991 inspection of the tanks revealed that small leaks had developed in the piping system associated with the tanks. This Removal Action is designed to process the uranyl nitrate to a stable form. The uranyl nitrate inventory will be neutralized and converted to a solid form which can be drummed and properly stored in warehouses pending final disposition.

Safe Shutdown (Removal Action No. 12): This removal action was initiated to ensure the safe and permanent shutdown of production facilities, including the removal of uranium and other process/raw materials from equipment and lines in the former production area. Disposition of uranium products and recoverable residues is an integral part of Safe Shutdown activities.

The annual update of Fernald site procedures to ensure that appropriate documentation supporting Safe Shutdown activities is entered into the Administrative Record was submitted to the U.S. EPA June 30, 1993.

The final Operational Readiness Review to allow workers to proceed with the removal of materials from equipment and lines was completed August 3, 1993. Work will be initiated when DOE completes a readiness assessment now in progress. In the meantime, preliminary work has been ongoing. Maintenance work orders to isolate and disconnect all utilities/energy sources have been prepared for equipment not in use.

Assessments of equipment and materials also is ongoing. Field evaluations of Plants 1, 4, 7, 8, and 9 have been completed. The field evaluation of Plant 5 is in progress.

While the amount of uranium products shipped since the production mission ended in July 1989 remains unchanged since the last community meeting in June 1993 (11.1 million pounds), there has been significant progress towards eventual removal of uranium from the site.

Fernald has sold about one-third (4.9 million pounds) of the approximately 15 million pounds of uranium offered for sale. The cost avoidance for disposal of that 4.9 million pounds at the Nevada Test Site (NTS) is more than $5 million, plus value to be received. The sold materials will be removed from the site over a span of two to three years. Safe Shutdown is evaluating the unsold materials to determine the most cost-effective disposition.

Workers have completed packaging approximately 2.3 million pounds of U.S. Army-owned material for future shipment off site. Because of its purity and classification, this material will be disposed of in a retrievable trench at the NTS in case of future need. With the prepackaging completed, Fernald can accomplish removal of this material within four months after the waste stream is approved for disposal at NTS.

Two sales of Fernald's nuclear materials inventory are currently in progress involving approximately 15 million pounds of uranium in various forms. These sales are expected to be finalized in 1993.

Plant 1 Ore Silos (Removal Action No. 13): This removal action involves the dismantling of the Plant

1 Ore Silos and their support structures. Due to deteriorated valves, materials leaked from the silos onto an elevated concrete pad in February 1991. The material, known as cold raffinate, is the waste residue from the processing of uranium ore after uranium is removed. Remaining material in the silos has been removed, containerized and placed in safe storage pending final disposition. All 14 silos and support structures will be dismantled under this removal action.

The subcontractor performing the work began demolition of the first concrete silo in October 1993. This removal action is scheduled for completion by December 18, 1994.

Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator (Removal Action No. 14): The scope of this removal action includes the isolation or removal and disposition of contaminated soils with elevated levels of uranium in the vicinity of an out-of-service solid waste incinerator at the sewage treatment plant. The project is designed to mitigate the potential for contaminant migration. Current activities include characterization, removal, containerization, storage and disposal of materials.

The first phase of the removal action (characterization) discovered a larger area of contamination than previous sampling had indicated. Contaminated soils from subsequent excavation activities that took place in October 1992 were placed in 187 white metal boxes. Representative soil samples were taken from the 187 boxes in April 1993 and sent to a laboratory for analysis. Analytical results which became available in June 1993 determined that appropriate disposal of the material was stockpiling it in controlled areas consistent with the approved work plan for Improved Storage of Soil and Debris (Removal Action No. 17).

A Work Plan Addendum detailing the need for additional excavations based on analytical results from the initial sampling was approved by the U.S. EPA and Ohio EPA in August 1993. The Work Plan Addendum contains the scope of work necessary for completing the remaining excavations. Field work began on the additional excavations in August 1993 and are tentatively scheduled for completion in April 1994.

Scrap Metal Piles (Removal Action No. 15): This removal action will address the stabilization and disposition of low-level radioactive waste scrap metal currently stockpiled outdoors at Fernald. The project is designed to eliminate the potential threat of material releases to the environment due to wind or rain from 1,300 tons of scrap copper and about 2,210 tons of recoverable ferrous and nonferrous scrap metals.

A contract was awarded for the final disposition of 2,210 tons of ferrous scrap metal at Fernald (Phase I). The contract emphasized recycling or other beneficial reuse. As a result, most of the 2,210 tons will be reused. The U.S. EPA approved the Removal Action Project Plan and field activities associated with this phase have been initiated. Containerization of the Phase 1 scrap metal pile began in February 1993. As of September 1993, 68 tons of nonferrous metal and 2,278 tons of ferrous metal have been shipped off site. To date, 1,493 tons have been recycled.

Containerization of the scrap copper pile (Phase IIA), including scrap copper ingots, was completed in March 1993.

A Request for Proposal was initiated for the off-site processing of the scrap copper pile (Phase IIB). Bids were due June 9, 1993, and are now being reviewed. This contract also emphasizes recycling or other beneficial reuse.

Non-recoverable scrap metal at Fernald is presently being packaged into appropriate containers and shipped off site for disposal under Removal Action No. 9 (Removal of Waste Inventories).

Improved Storage of Soil and Debris (Removal Action No. 17): This removal action provides a sitewide management concept and implementation strategy for the improved storage of contaminated soil and debris generated as a result of performing cleanup at Fernald. Activities under this removal action will include construction of four interim storage structures for the management of contaminated soils and debris until their final disposition under Operable Unit 3 and Operable Unit 5 Records of Decision.

The final work plan was submitted to the U.S. EPA on April 21, 1993.

Detailed design of the above-ground structures and facilities to support this removal action continues. Tension Support Structures, similar to those currently being used to provide indoor storage for drummed waste on the Fernald site's Plant 1 Pad,

will be constructed to provide improved storage of soil and debris and to mitigate the potential spread of contamination.

Plant 7 Dismantling (Removal Action No. 19): The work plan for this removal action was approved by the U.S. EPA on July 30, 1993. Plant 7 was originally built to convert uranium hexafluoride (UF6) to uranium tetrafluoride (UF4). Plant 7 has been idle since the mid-1950s. All process equipment was removed from Plant 7 in the late 1950s. Plant 7 is presently being used to store approximately 5,000 drums of UF4, as well as empty cans and drums. Activities under this removal action will include characterization, decontamination, removal, containerization and disposal or reuse of materials in the building, and decontamination and dismantling of the building itself.

Pilot Plant Sump (Removal Action No. 24): This removal action was initiated to address contaminated liquids and sludges remaining in an out-of-service sump at the Pilot Plant. The below-grade sump is a stainless steel cylinder approximately two feet in diameter and 10 feet deep. The sump was installed to remove liquids from the floor drains of the Pilot Plant during the renovation of the Pilot Plant in 1969.

Analyses of the sludges and liquids from the sump show high concentrations of metals (lead, copper, chromium, and nickel), as well as thorium and volatile organic compounds.

Accumulated liquids were pumped out of the tank on a monthly basis prior to removal of the sump. Under this removal action, the stainless steel sump was removed and its associated piping disconnected. The drain system was plugged in September 1993. Adjacent soils will be cleaned up as required.

This removal action is scheduled for completion in October 1993.

Nitric Acid Tank Car and Area (Removal Action No. 25): This removal action was initiated to remove the residual contents of a Nitric Acid Railroad Tank Car, decontaminate and dispose of the tank car itself, and address potentially contaminated surrounding soils related to the tank car. The high-grade stainless steel tank car stored nitric acid from 1952 until 1989 for use in the former production process at Fernald. The tank car has a capacity of 100,000 gallons and contained approximately 100 gallons of dilute nitric acid before it was emptied.

After the tank car contents were removed, a series of rinse were performed in September 1993. Contaminated soils will be cleaned up as required.

Asbestos Removals (Asbestos Program) (Removal Action No. 26): This removal action documents ongoing asbestos abatement activities at Fernald to mitigate the potential for contaminant release and migration. Abatement activities within the existing Asbestos Program include repairs, encasement, encapsulation or removal of asbestos-bearing materials which exist in many buildings on the Fernald site. Field activities in support of asbestos identification and abatement are in progress. The annual procedural updates for Asbestos Removals were submitted to the U.S. EPA and Ohio EPA in June 1993.

Fire Training Facility (Removal Action No. 28): This removal action was initiated to address an area historically used to simulate fire and emergency response conditions for training purposes. The Fire Training Facility is located just north of the former production area on the old North Access Road. Work will include removal, decontamination, and disposal, treatment or storage of all buildings, structures, tanks, and equipment. The draft work plan was submitted to the U.S. EPA and Ohio EPA on June 29, 1993. Comments received from both agencies have been addressed and the work plan has been revised accordingly. The revised plan was submitted to the agencies October 5, 1993, for final review.

Cleanup Alternatives

Several cleanup alternatives have been identified for Operable Unit 3. All of these options include regular maintenance and monitoring. Much of the cleanup work involves the disposal of inventoried waste materials in either an on-site or an off-site disposal facility, removal and decontamination of buildings and equipment, and disposal of remaining contaminated materials in approved, engineered facilities either at the Fernald site or off site. Implicit within all Operable Unit 3 alternatives is an emphasis on the recycling and recovery of building materials and equipment to minimize waste disposal requirements.

More definitive descriptions of alternatives will be provided in RI/FS documents.

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More information about Operable Unit 3 is available in the Public Environmental Information Center (PEIC), where Fernald Project cleanup documents are kept in the Administrative Record. The PEIC is located in the JAMTEK building, 10845 Hamilton-Cleves Highway, Harrison, Ohio, 45030. The telephone number is (513) 738-0164.